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Organizational climate and climate strength in UK hospitals

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In recent years, researchers have paid increasing attention to the idea of “climate strength”—the level of agreement about climate within a work group or organization. However, at present the literature is unclear about the extent to which climate strength is a positive attribute, and is concerned predominantly with small teams or organizational units. This article considers three theoretical perspectives of climate strength, and extends these to the organizational level. These three roles of climate strength were tested in 56 hospitals in the United Kingdom. Positive relationships were discovered between two of three climate dimensions (Quality and Integration) and expert ratings of organizational performance, and a curvilinear effect between Integration climate strength and performance was also found. Very high or very low Integration climate strength was less beneficial than a moderate level of climate strength. However, there were no interaction effects discovered between climate and climate strength. Implications for future climate strength research are discussed.

Organizational climate has been a topic of considerable research over the last 30 years, although there remains some lack of consensus on the precise specification of the construct (Kopelman, Brief, & Guzzo, 1990; Patterson et al., 2005). Most authors agree that it is a complex, multilevel, and multidimensional phenomenon (Glick, 1985), derived from employees’

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perceptions of their experiences within an organization, stable over time, and widely shared within an organizational unit (Koys & DeCotlis, 1991). Many studies have examined both the antecedents and consequences of Organizational Climate (OC) (e.g., Ashkanasy, Wilderom, & Peterson, 2000; Rousseau, 1988; Schneider, Gunnarson, & Niles-Jolly, 1994; Schneider, White, & Paul, 1998). Kopelman et al. (1990) for example identify societal (and organizational) culture as antecedents of organizational practices, specifically HR practices. How these are enacted gives rise to the particular employee perceptions and interpretations which are measured as organizational climate. One question of major interest has been the link between OC and organizational outcomes, such as performance, innovation, and staff well-being. Kopelman et al.'s model posits a link to organizational productivity, through cognitive and affective states leading to salient organizational behaviours. Schneider, Bowen, Ehrhart, and Holcombe (2000) demonstrated a link between service climate and customer satisfaction. They argue that a positive service climate for employees leads to service-oriented behaviours by employees towards customers, which lead to positive customer reports on service quality. This in turn is likely to be reflected by greater profitability.

These studies highlight one further layer of complexity in the climate literature, namely the consideration of climate as a global construct with common core dimensions across organizations (e.g., Campbell, Dunnette, Lawler, & Weick, 1970; Kopelman et al., 1990; Patterson et al., 2005), versus consideration of specific facets of climate in relation to focused organizational outcomes, for example climate for service (Schneider, 1990) or climate for innovation (Anderson & West, 1998; West, 1990). These differences however are primarily in relation to the focus of the study, whether mapping and comparing climates between organizations and over time, or testing specific linkages between facets of climate and specific organizational outcomes. This study takes a generalized approach to climate, although restricting the investigation to those aspects of climate deemed to be pertinent to organizational performance within the UK National Health Service.

When examining the links between OC and outcomes, researchers typically use an aggregate measure of individual employees' responses. The rationale behind aggregating individual data to a unit level is the assumption that organizational collectives have their own climate, and that these can be identified through the demonstration of significant differences in climate between units and significant agreement in perceptions within units (James, 1982). This, according to Chan's (1998) typology of composition models, is a *direct consensus* model (or a *referent-shift* consensus model if the language of the items refers to "we"/"members of my organization" etc. rather than "I"). However, in recent years, a different type composition model has become the subject of increasing climate research. Climate strength, which

measures the extent of agreement between individuals about organizational (or group) climate, is an example of what Chan called a *dispersion model*. Dispersion models differ from direct consensus models in that they do not measure the level of a construct (e.g., climate), but the extent to which it varies. Where the variable of interest is intrinsically a higher level construct—e.g., OC—the dispersion model measures the variability in the perception of this construct.

Climate strength is a relatively new topic of research, and there is little consensus over the role that it plays in the relationship between climate (measured at the unit level) and various outcomes (including unit performance, aggregate well-being, and group processes, as well as attitudinal and affective outcomes). Broadly speaking, three types of role have been hypothesized and tested. These are now considered in turn, and prior research supporting each considered.

The first is that climate strength has a direct, linear effect on performance and affective outcomes, above and beyond any direct effects of climate itself. This perspective is based on the similarity-attraction paradigm (Berscheid & Walster, 1978; Byrne, 1971), which suggests that individuals tend to be attracted to others who are more similar to them, in terms of demographic characteristics, views, activities, or attitudes (Green, Anderson, & Shivers, 1996). Moreover, similarity between individuals is related to frequent communication, integration, and cohesion in social groups (Tsui & O'Reilly, 1989), which in turn are positively related to performance and other outcomes. Lindell and Brandt (2000) also suggest that minimum-consensus climate would lead to interpersonal friction, conflict, and process losses, leading to more negative outcomes. In support of this hypothesis, Bliese and Halverson (1998) found a direct link between strength of leadership climate and aggregate well-being in military groups; although there is little support for direct, linear effects of climate strength on performance outcomes (Lindell & Brandt failed to find evidence in support of their theory). A similar perspective was used by Barsade, Ward, Turner, and Sonnenfeld (2000) in explaining how affective diversity was related to group processes and performance in top management teams.

The second role of climate strength to have been hypothesized and tested in the literature is that it should have a moderating effect on the relationship between climate and outcomes, particularly behavioural outcomes. This perspective is based on Mischel's (1973) concept of *situational strength*, which posits that strong situations are created when aspects of the situation lead people to perceive events the same way, induce uniform expectations about the most appropriate behaviour, and instil necessary skills to perform that behaviour. Conversely, individual differences will determine behaviour most clearly in ambiguous, weak situations. As Schneider, Salvaggio, and Subirats (2002) argued, this implies that an organization with a strong

climate (i.e., a place where events are perceived in the same way and where expectations are clear) should produce uniform behaviour from people in that setting; in particular, where climate is both positive and strong, one would expect the most consistently positive behaviours from employees, and where climate is negative and strong, one would expect the most consistently negative behaviours.

The moderating role of climate strength has been tested in a number of empirical studies, with contrasting findings. Schneider et al. (2002) found only one out of their four climate strength hypotheses—involving agreement about managerial practices—was supported when testing the moderating role of climate strength on the relationship between climate and customer satisfaction in bank branches (although four out of five predictive hypotheses with customer perceptions were supported). Neither Bliese and Halverson (1998), nor Lindell and Brandt (2000), found any significant interaction effects when looking at well-being in military units and outcomes of US local emergency planning committees, respectively. González-Romá, Peiro, and Tordera (2002) found three out of six interactions significant when aggregate work satisfaction and organizational commitment were the outcomes in regional public health service work units.

The third possible link between climate strength and outcomes that has been hypothesized is that of a direct but curvilinear relationship. Specifically, climate strength is predicted to have a positive effect on affective and performance outcomes until it reaches a certain (optimal) level—after which it has a negative effect (an “inverted-U” relationship). This perspective is rooted in diversity theory: climate strength, being a measure of dispersion within a unit, can be characterized as a deep-level diversity construct. Harrison and his colleagues (Harrison, Price, & Bell, 1998; Harrison, Price, Gavin, & Florey, 2002) have distinguished between surface-level diversity (based on demographic and work-based characteristics that are easily observed, e.g., sex, age, race, job function) and deep-level diversity (based on characteristics such as psychological features that are not easily observed, e.g., personality traits, values, attitudes, beliefs, preferences, and perceptions). Clearly climate strength fits into this definition of deep-level diversity. However, as reviews of the diversity literature (e.g., van Knippenberg & Schippers, 2007; Williams & O'Reilly, 1998) have shown, there is little consensus about the effects that diversity has on outcomes. Many researchers (e.g., Chatman, Polzer, Barsade, & Neale, 1998; Jackson et al., 1991; Jehn, Northcraft, & Neale, 1999) have shown direct effects of various diversity constructs on particular outcomes—either positive or negative, even for the same outcome; others (e.g., Harrison et al., 1998, 2002; Pelled, Ledford, & Mohrman, 1999) have shown interactive (i.e., moderated) effects of diversity (these two approaches corresponding to the first two perspectives on the role of climate strength in predicting outcomes).

However, some diversity researchers have suggested that the relationship between diversity and some outcomes may be curvilinear (e.g., Webber & Donahue, 2001; Williams & O'Reilly, 1998). In particular, Williams and O'Reilly (1998, p. 90) suggested that diversity is likely to have an "inverted-U" shape relationship with outcomes such as group performance.

In the case of climate strength, such a relationship could be explained by considering the extreme situations: absolute climate strength (no disagreement) and very little climate strength (no agreement). In the case of no disagreement, this may be reflective of very similar views and opinions within the group regarding more aspects than simply the organizational or group climate. If group members tend to agree about everything, there will be a lack of range of perspectives in the group, which can lead to a stifling of innovation and consequently less effective team working. On the other hand, when group members disagree significantly, this can lead to intragroup conflict and subsequently poorer performance. A compromise between these two positions—where there would be some diversity of perspective, and yet moderate levels of agreement—would, under this theory, lead to the best results. Although this has not been tested in as many studies that have tested the other roles of climate strength, González-Romá and West (2005) found such an "inverted-U" shaped relationship between climate strength (for Participation) and innovation in health care teams.

Of course, this is not necessarily the case for all climate dimensions. For example, quality is something where very high agreement could be very positive, as long as the agreement was that the climate was good. To have a range of perspectives about quality would suggest that some members of a group perceived the quality of their work to be less important than others, leading to poorer performance. Therefore we may expect differential effects for different climate dimensions.

CLIMATE STRENGTH AT THE ORGANIZATIONAL LEVEL

One common feature of the published research on climate strength is that it deals with small work groups or organizational units. However, the concept of organizational climate has often been applied to, and measured in, larger organizations (e.g., Patterson, Warr, & West, 2004; Patterson et al., 2005; Schneider, Hanges, Smith, & Salvaggio, 2003), and so an obvious question to ask is to what extent, and in what ways, do the concept and role of climate strength also apply to these larger organizations?

There are theoretical reasons to believe that the relationship between climate strength and performance may be different in larger organizations compared with smaller groups. In their description of Dispersion Theory, Brown and Kozlowski (1999) state that individual-level constructs combine

through social interaction processes to emerge as unit-level phenomena (e.g., organizational climate). Thus the process of emergence of an organizational climate must be substantially different in an organization of thousands of people compared with a team of five or six people. In large organizations, individuals will typically interact with only a subset of the other employees on a regular basis; in a smaller organization unit such as a team, individuals will probably interact with most, if not all, of the other members frequently. Thus the formation of an organizational climate is probably a slower, more haphazard process than that of a team climate, and is likely to be more dependent on top-down processes rather than bottom-up processes. So a very strong climate in a large organization (one of several hundred people) could reflect an organization where perceptions of climate are heavily driven by senior management, with little opportunity for departmental autonomy or creativity. Equally, a very weak climate may be due to an organization having no overall direction or consensus about its aims and objectives. This implies that climate strength may be more likely to have a curvilinear effect on performance.

In this article we examine the three primary competing models for the effect of climate strength—linear, curvilinear, and interactive—to see which is most supported by the data in UK hospitals. Hospitals are large and complex organizations, and so differ considerably from most groups previously studied in the climate strength literature, which have tended to be very small in comparison. The structure of these organizations is such that individuals may belong to one, or several, work groups or teams, each with its own tasks but which often require working together with members of other groups to provide patient care. This cross-working between teams and departments is one reason why organizational climate can develop, and also suggests that a lack of agreement about climate may represent a less integrated organization.

Although we do not formulate specific hypotheses regarding the nature of the relationships, we note that the arguments presented above for extension to the organizational level may mean that results would also differ from those found in the climate strength literature at present.

METHOD

Sample

The data used in this study were collected as part of the Commission for Health Improvement's (CHI's) Clinical Governance Reviews (CGRs) of National Health Service (NHS) organizations in the United Kingdom. CHI has now ceased to exist as an organization, its functions taken over by the Healthcare Commission, but before 2004 CHI performed a review on each

organization (NHS trust). Beginning in 2002, in each organization in turn, a random sample of 500 staff were sent questionnaires about their experiences working in their organization, including a variety of questions about OC. This study uses data from the first 56 acute trusts (hospitals) to be surveyed. A total of 11,903 responses were received from these hospitals—a response rate of 42.5%. Response rate within each hospital varied from 14% to 66%. Although 14% is a low response rate, this was partly because the survey in this hospital was conducted during the summer holiday period, and the number of respondents (72) was still sufficient for relatively accurate assessment of climate and climate strength (see Dawson, 2003, and Timmerman, 2005, for discussion of what response rates are acceptable in finite populations). One possible concern was that the low response rates in some organizations could lead to sampling bias—we tested this by correlating the response rate with both climate and climate strength. No correlations were significant, suggesting there was no systematic response bias in the responses to the climate questions.

Measures

Climate. The questionnaires contained 33 climate items, which are shown in Table 1. Initially these were separated into eight scales, identified by the Commission for Health Improvement as being relevant to the general climate within NHS organizations: emphasis on quality, communication, support for team working, interdepartmental collaboration, support for staff welfare, equity and safety, support for training, and climate for incident reporting (responses made on a 5-point scale, ranging from “strongly disagree” to “strongly agree”). However, many of these include very similar or overlapping content, and most fall into the Human Relations quadrant of Patterson et al.’s (2005) operationalization of the Competing Values model (Quinn & Rohrbaugh, 1983). This approach “emphasizes the well-being, growth and commitment of the community of workers within an organization” (Patterson et al., p. 384). Given the nature of the NHS as an employer, it is understandable that this management ideology should be espoused in an internal context that requires integration, collaboration, training, and development within a caring community.

Therefore, to determine the true underlying factor structure, the sample was split at random into two parts. On the first subsample, we conducted exploratory factor analysis (principal axis factoring) with a varimax rotation; three factors were suggested using a scree test (these three explaining just over 50% of the variance in all items between them, the next factor only explaining 4%). Four items were excluded from these factors due to cross-loadings, but otherwise items with loadings above 0.40 were

TABLE 1
Results of factor analysis on climate items

<i>Item</i>	<i>Factor 1 Well-being</i>	<i>Factor 2 Quality</i>	<i>Factor 3 Integration</i>
This organization does not have much of a reputation for top quality patient care*	0.13	0.53	0.22
There is an emphasis on patient-focused care in this organization	0.22	0.64	0.19
This organization sets extremely high standards for its staff	0.26	0.69	0.15
As a patient, I would be happy to have care provided by this organization	0.23	0.70	0.18
Quality is taken very seriously here	0.31	0.78	0.21
Staff in this organization are able to question the basis of what the organization is doing	<i>0.47</i>	<i>0.49</i>	<i>0.27</i>
The organization has clear standards which staff try to meet in order to achieve excellence	0.34	0.63	0.21
Communication in the organization is very good	<i>0.48</i>	<i>0.28</i>	<i>0.43</i>
Communication between management and staff is excellent in the organization	<i>0.54</i>	<i>0.28</i>	<i>0.42</i>
Different sections of the organization do not keep each other informed about what's going on*	0.22	0.09	0.52
There are often breakdowns in communication here*	0.26	0.10	0.57
Working in teams is considered very important in this organization	<i>0.36</i>	<i>0.28</i>	<i>0.34</i>
Teamwork exists in name only here*	0.29	0.25	0.49
My team/work group finds itself in conflict with other teams or departments in this organization*	0.09	0.13	0.61
Teams and departments are cooperative and helpful to each other in this organization	0.24	0.20	0.55
We are hampered in our efforts to improve patient care by other teams and departments*	0.05	0.16	0.61
Cooperation between teams and departments is recognized and encouraged in this organization	0.32	0.27	0.52
I have the opportunity to talk to someone at work about the emotional demands of the job	0.61	0.14	0.13
Training is provided in how to cope with the emotional demands of the job	0.59	0.15	0.15
People are encouraged to be open about the emotional demands of their work	0.65	0.15	0.17
The organization has created an environment where people can succeed, whatever their job or status in the organization	0.57	0.34	0.32
Staff in the organization have equal opportunities, whatever their job or status in the organization	0.53	0.29	0.29
The organization pays little attention to the interests of its employees*	<i>0.40</i>	0.29	<i>0.41</i>
The organization tries to be fair in its actions towards employees	0.51	0.34	0.30

(continued opposite)

TABLE 1
(continued)

<i>Item</i>	<i>Factor 1 Well-being</i>	<i>Factor 2 Quality</i>	<i>Factor 3 Integration</i>
The organization has created a safe working environment	0.42	0.36	0.24
The organization strongly believes in the importance of training and development	0.51	0.39	0.26
People here are strongly encouraged to develop their skills	0.58	0.37	0.28
People here receive enough training before using new equipment	0.49	0.33	0.28
The organization only gives people the minimum amount of training they need to do their job*	<i>0.27</i>	<i>0.22</i>	<i>0.34</i>
When mistakes are made appropriate action is taken	0.60	0.22	0.18
I feel able to report poor standards/poor quality care I observe	0.59	0.20	0.15
When mistakes are made they are dealt with fairly	0.68	0.19	0.20
When mistakes are made we learn from them and changes are made	0.61	0.24	0.21
% variance explained after rotation	19.5%	14.0%	12.0%

Loadings in bold indicate those items that were used to create each climate scale. Items in italics were excluded from further analyses due either to cross-loading or weak factor loading. *Items followed by asterisks were reverse scored before factor analysis.

brought together to represent three climate dimensions: Well-being (concern for welfare of employees), Quality (emphasis on providing good quality patient care), and Integration (the extent to which teams, work groups, and departments work together to achieve their tasks). Factor loadings and proportions of variance explained are shown in Table 1. Two items did not load strongly onto any of the factors so were not considered further.

The second subsample was used to test this factor structure using confirmatory factor analysis (CFA), and test the scale reliabilities. CFA showed that the factor structure had a satisfactory fit, with a CFI of 0.911 (compared with a satisfactory minimum of 0.9), and a reasonable error of approximation, with an RMSEA of 0.064 (compared with a satisfactory value of 0.060, and an acceptable maximum of 0.080). The Chi-squared value of 10825.27, on 321 degrees of freedom, was inflated due to the large sample size. Cronbach's alpha for the three scales was good: .92 for Well-being, .88 for Quality, and .82 for Integration.

Outcomes. As hospitals are large, complex organizations with competing priorities and various stakeholders, there are no outcome measures that completely assess the overall performance of these organizations. Therefore we used measures that reflect how well the organizations achieve these varied goals, which are accepted within the sector as providing a basis for evaluation of effective performance. These include dimensions relating to well-being of patients (e.g., clinical effectiveness and risk management), and dimensions relating to successful management. The outcome measures used were collected during the clinical governance review process.

As the main part of the clinical governance review process, a team of five independent experts—including an NHS manager, a doctor, a nurse, an allied health professional, and a lay person—participated in rigorous rater training before reading documents from, and spending a week in, each organization. After reviewing documentary evidence from the organizations, patients, and other stakeholders, as well as extensive observation and interviews with members of staff and patients, the review team met, discussed and rated each organization on seven dimensions with evidence-based criteria. These performance dimensions included: "Staffing & staff management" (including the recruitment, management and development of staff, and the promotion of good working conditions and effective methods of working), "Education, training and continuing personal and professional development" (covering the support available to enable staff to be competent in doing their jobs, whilst developing their skills and the degree to which staff are up to date with developments in their field), "Clinical audit" (regular systematic review of procedures against defined clinical standards), "Risk management" (systems to understand, monitor, and minimise the risks to patients and staff and to learn from mistakes), "Clinical effectiveness"

(ensuring that the approaches and treatments used are based on the best available evidence), “Patient and public involvement” (referring to how patients, carers, service users, and the public have a say in decision making about health service delivery, policy, and planning), and “Use of information” (the systems in place to collect and interpret clinical and other information and to use it to monitor, plan, and improve the quality of patient care) (Healthcare Commission, 2004). The ratings were made approximately 3 months after the survey data were collected as the culmination of a thorough review process, and were made jointly by all members of the review team upon completion of the review (as opposed to making separate ratings that were later combined), so interrater reliability is not relevant. The rating in each case was a single score on an ordinal scale: 1, 2a, 2b, 2c, 3, or 4. The anchors ranged from 1 = “little or no progress at strategic and planning levels or at operational level” to 4 = “excellence—coordinated activity and development across the organization and with partner organizations in the local health economy that is demonstrably leading to improvement. Clarity about the next stage of clinical governance development.” These ratings are published online (Healthcare Commission, 2004).

These ratings are particularly useful as outcomes for two reasons. First, the surveys were carried out in the different hospitals across a period of 18 months, but the ratings were made at a point that was a consistent length of time after the survey in each case. Other published performance measures would necessarily differ in the time lag after the survey. Second, the hospitals included a wide range of different sizes, types (including teaching and specialist hospitals), and locations. Other performance measures, such as patient outcomes, would be influenced by many other factors such as caseload, which would not be adjustable for in a small sample such as this. The use of these ratings as outcomes ensures that all organizations are being measured on a consistent basis which is independent of such external factors. Furthermore, the significance of the role, and powers, that CHI (and its successor, the Healthcare Commission) has in the NHS is such that hospitals treat their ratings in these reviews very seriously indeed.

When entered into a factor analysis (using principal axis factoring), the seven dimensions loaded onto a single factor, which explained 54.3% of the total variance; all factor loadings were above 0.65 and of a similar magnitude to each other. The seven dimensions also demonstrated a high level of internal reliability (Cronbach’s $\alpha = .86$), so a single performance measure was constructed by taking the mean of all seven scores; this level of reliability also suggested the single performance measure adequately distinguished between organizations. The broad nature of the different criteria being rated means that such a single score can be viewed as an

overall measure of organizational performance, albeit from a management perspective. This measure is comparable across the different types of organization and brings together the different aspects of performance described earlier. The overall performance measure very closely followed a normal distribution, with a mean of 1.88, a standard deviation of 0.37, and a range from 1.00 to 2.67.

Climate strength. Following research on climate strength by González-Romá et al. (2002), we calculated climate strength using Burke, Finkelstein, and Dusig's (1999) AD_M measure, which calculates the average deviation from the mean of all individuals in a unit using the following formula:

$$AD_M = \frac{\sum_{i=1}^N |x_i - \bar{x}|}{N}$$

where x_i represents the individual climate scale score, and \bar{x} the overall organizational climate score for that variable.

This measure has the advantage over other measures of dispersion that it can be more readily interpreted in terms of the original response scales (Burke & Dunlap, 2002). That is, a value of $AD_M = 1$ represents a group where, on average, group members score exactly one response scale point away from the group mean. The measure was multiplied by -1 before being entered into analyses, so that a positive score represented a stronger climate (i.e., less deviation).

Support for data aggregation

As reported by James (1982), in order to justify aggregating individual data to a group (or, in this case, organizational) mean, it is necessary to demonstrate both reliable differences between groups, and agreement with groups. (To some extent this necessity may be mitigated by the fact we analyse climate strength as well; however, such justification is still necessary if we are to interpret main effects of climate scales.) Table 2 shows values of

TABLE 2
Interclass correlations, AD_M and $r_{WG(j)}$ statistics for climate variables

<i>Climate scale</i>	<i>ICC(2)</i>	<i>ICC(1)</i>	<i>Mean AD_M (range)</i>	<i>Mean $r_{WG(j)}$ (range)</i>
Well-being	0.96	0.12	0.54 (0.44–0.72)	0.84 (0.68–0.92)
Quality	0.95	0.11	0.56 (0.38–0.71)	0.95 (0.91–0.98)
Integration	0.94	0.09	0.55 (0.32–0.74)	0.96 (0.92–0.97)

ICC(2) and ICC(1) (intraclass correlations; to measure interrater reliability), and AD_M and $r_{WG(j)}$ (to measure agreement) for each organization (James, Demaree, & Wolf, 1984, 1993; a more familiar index for demonstrating agreement) for the three climate scales. The results show very good levels of interrater reliability demonstrated by values of ICC(2) far higher than 0.70 (suggesting very good reliability of the group mean), and values of ICC(1) that are well within the range suggested by Bliese (2000). The agreement indices— AD_M and $r_{WG(j)}$ —both indicate fairly good of agreement. Average values of $r_{WG(j)}$ are comfortably above the cutoff of 0.70 typically used to represent good agreement, although individual values in organizations are as low as 0.68, representing some variation (which is useful as climate strength is being analysed). Values of AD_M are all lower than the suggested Burke and Dunlap (2002) cutoff criterion of $c/6 = 0.83$ (where c , the number of response options, is 5 in this case), again supporting aggregation to the organizational level.

Analysis performed

Four sets of regression analysis were used to test the effects of climate and climate strength on organizational performance. First, we tested for direct effects between the climate variables and performance. Second, we tested to see whether climate strength had an additive (linear) effect on performance beyond that of climate. Third, we tested to see whether there was an interactive effect of climate strength and climate on performance (using moderated multiple regression). Finally, we tested to see whether there were curvilinear effects between climate strength and performance. In each case, the climate variable was entered first, and the climate strength variable(s) entered after. As with previous climate strength research (e.g., Bliese & Halverson, 1998; González-Romá et al., 2002; Lindell & Brandt, 2000), it was necessary to include the climate terms in all models because there can be a significant correlation between climate and climate strength, and any effect of climate strength should be above and beyond any effect of climate itself; not only is this possible from a theoretical point of view, but a statistical artifact of the way climate dimensions are measured on a 5-point scale means that these correlations can occur even when there is no correlation between the underlying constructs (see Bliese & Halverson, 1998, p. 565 for a full explanation).

The outcome variable was tested for differences according to size of organization, region, and teaching status (teaching/nonteaching). No differences were found, so no control variables were included to preserve the largest number of degrees of freedom possible with a relatively small sample.

RESULTS

Correlations between all three climate measures, climate strength and performance are shown in Table 3. Although the correlations between climate variables were relatively high (up to .68), the confirmatory factor analysis described previously indicates that they are indeed separate constructs. All correlations shown are at the organizational level.

It can be seen that there are significant relationships between two of the climate variables and performance: Well-being and Quality. These are both in the expected direction (the better the climate, the higher the performance is rated), and the correlations are .27 and .29 respectively, representing moderate sized effects.

Table 4 shows the results of regression analyses to determine whether there are any additive (linear) or interactive effects of climate strength on performance. The two climate variables that have significant correlations with performance are still significant when climate strength is included in the equation, although for these, the level of climate strength does not appear to make a difference. The other climate variable, Integration, provides a significant effect of climate strength on performance. This is appears to be a negative effect: the lower the agreement about Integration, the higher the performance is rated. However, there were no interaction effects between climate and climate strength on performance.

Table 5 shows the results of tests for curvilinear effects of climate strength on performance. Just as climate strength for Well-being or Quality did not have any linear effect on performance, neither did they have any curvilinear effect. However, the effect of climate strength for integration is shown to be

TABLE 3
Descriptive statistics and intercorrelations of climate variables and performance

<i>Scale</i>	<i>Mean</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1. Well-being	3.29	0.16						
2. Quality	3.49	0.29	0.68**					
3. Integration	3.04	0.12	0.58**	0.46**				
4. Climate strength for well-being	0.54	0.05	−0.33*	−0.13	−0.06			
5. Climate strength for quality	0.56	0.07	−0.20	−0.14	−0.45**	0.36**		
6. Climate strength for integration	0.55	0.09	0.08	0.31*	−0.19	0.28*	0.79**	
7. Organizational performance	1.88	0.37	0.27*	0.29*	0.20	0.03	0.20	0.27*

p* < .05, *p* < .01 (two-tailed).

TABLE 4
Results of regression analyses of performance on climate and climate strength

<i>Climate scale</i>	<i>Well-being</i>	<i>Quality</i>	<i>Integration</i>
(1) Climate alone			
Climate (β)	.27*	.29*	.20
R^2	.08	.09	.04
$F(1, 54)$	4.36*	4.99*	2.27
(2) Climate strength added			
Climate (β)	.32*	.33*	.26
Climate strength (β)	-.14	-.25	-.32*
R^2	.09	.14	.14
$F(2, 53)$	2.66	4.43*	4.21*
(3) Interaction term added			
Climate (β)	.34*	.31*	.26
Climate strength (β)	-.14	-.21	-.32*
Interaction (β)	-.07	.14	.00
R^2	.10	.16	.14
$F(3, 52)$	2.31	3.23*	4.37**

* $p < .05$, ** $p < .01$ (two-tailed).

TABLE 5
Results of curvilinear regression analyses of performance on climate strength

<i>Scale</i>	<i>Well-being</i>	<i>Quality</i>	<i>Integration</i>
Climate (β)	.35*	.30*	.29*
Climate strength (β)	.15	.12	.11
Climate strength ² (β)	-.16	-.17	-.33*
R^2	.12	.16	.20
$F(3, 52)$	3.74*	3.38*	4.79**

* $p < .05$, ** $p < .01$ (two-tailed).

better estimated by a curve rather than a straight line. This is an “inverted-U” type relationship between climate strength and performance: that is, when there is very high or very low dispersion of scores (low or high climate strength respectively), performance ratings are low. However, when there is a moderate level of dispersion—moderate climate strength—performance ratings are higher. This is shown in Figure 1, which represents this curvilinear effect graphically. It can be seen that towards the higher end of the climate strength scale, the effect is more negative than it is at the lower end of the scale, which seems to have caused the apparent negative linear effect in Table 4. However, the R^2 for the model including the curvilinear

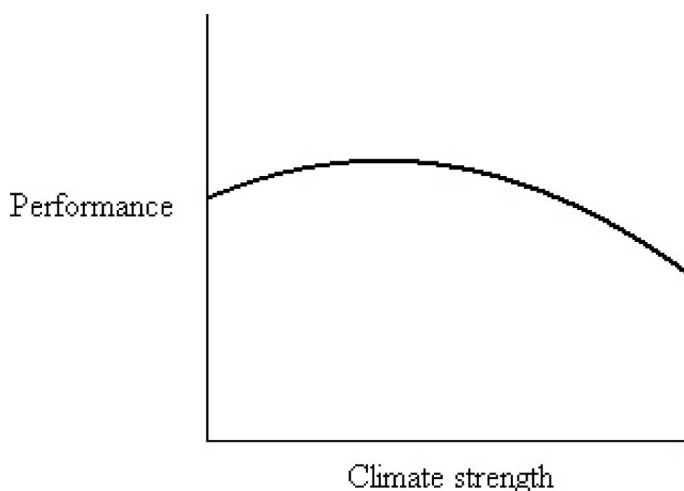


Figure 1. Curvilinear effect of climate strength for Integration on organizational performance.

effect has increased by from .14 to .20, and the adjusted R^2 from .10 to .16, suggesting the added explanatory effect of the curvilinear term is substantial.

DISCUSSION

The purpose of this article was to extend the concept of climate strength to an organizational setting, and to test three competing theories about the relationship between organizational climate, climate strength, and performance—based on findings from smaller organizational units—in UK hospitals. This study found links between two of three climate variables tested and performance, and curvilinear relationships between climate strength of the other climate variable and performance.

The two climate variables to display direct linear relationships with performance were Well-being and Quality. Specifically, when the climate in each of these areas increased, so did the performance ratings. These findings were in line with research in other sectors that suggested a positive relationship between organizational climate and performance, e.g., Schneider et al. (1998). In particular, though, the findings fit in with other climate research on these particular areas: Neal, West, and Patterson (2004) found a significant relationship between climate for well-being and organizational productivity in manufacturing organizations; and West and Anderson (1996) demonstrated significant relationships between climate for quality (which they called task orientation) and administrative effectiveness in top management teams.

The Integration scale did not have a direct effect on performance. This is perhaps surprising given the complicated structure of the organizations in the study, and the nature of the work undertaken within them. Individuals, teams, and departments in hospitals need to work together in order to provide patient care, it might be expected that integration would be necessary in order to work effectively. But not all individuals, teams, and departments need to work with others to the same extent, and this may be why there is no effect here. This scale is a composite of items originally designed to assess communication, team working, and interdepartmental cooperation. While all these items share the common integration theme, the different levels of integration indicated (inter- and intrateam) may be masking direct effects at the group level. Brodbeck (1996) identifies that the relationship between group performance and effectiveness (defined as the degree to which performance outcomes approach goals) may be moderated by situational constraints external to the group. The outcome measure used does not clearly identify the need for interdepartmental collaboration. Moreover, when the original dimension of support for team working was examined a strong relationship with performance was identified.

A more intriguing explanation emerges when the curvilinear effect of climate strength found for this variable is considered. All hospitals have employees who need to interact with other teams and departments in order to achieve their tasks. However, this is not necessarily the case for all employees or all teams. A very strong climate might arise through senior management prescribing strict rules about how teams and departments should interact with one another. For individuals and teams whose main task does not involve collaboration with others, this could be to the detriment of their performance. Moreover, a strong organizational message about such a climate dimension could be reflective of a generally perceived “top-down” approach in the organization, with individual employees, teams, and departments having less scope for autonomy, creativity, and innovation, in turn stifling their performance. In contrast, a very weak climate may imply that departments, teams or individuals are “doing their own thing”, with little common direction or purpose.

This would fit with the findings of one previous study (González-Romá & West, 2005), which suggested a curvilinear relationship between climate strength and outcomes—very high or low climate strength leading to less innovative teams. Indeed this finding mirrors effects found in diversity research, which makes sense when climate strength is considered as a diversity construct (e.g., Richard & Shelor, 2002, who reported a curvilinear relationship between age diversity in top management teams and firm performance).

This however does raise a question as to why a curvilinear relationship was found with Integration and not with either Well-being or Quality.

This might be explained through consideration of the meaning of the constructs. While it could be argued that limited diversity in viewpoints might stifle creativity, it would be difficult to conceive of a situation where diversity of opinion on the importance of quality in healthcare would be advantageous. To return to Kopelman et al.'s (1990) construction of core climate dimensions, agreement on Goal Emphasis, the types of outcomes and standards expected (as in the Quality dimension here) implies a unified focus and direction for the organization. In contrast, agreement on Means Emphasis, the methods and procedures expected by management (here represented by Integration), may represent strong underlying values for "how to work", or may simply represent an overcontrolling management limiting flexibility, autonomy, and innovation. As such, climate strength of Means Emphasis may be considered a double edged sword.

Some previous research had suggested that climate strength may moderate the relationship between climate and outcomes. However, no results to support this hypothesis were found in this study. This is perhaps not surprising: Of the four studies mentioned earlier that tested for these relationships, two did not find any either; and one of those that did (Schneider et al., 2002) only found one out of four concurrent relationships to be moderated. In addition, all the previous studies had been conducted in small organizations or work groups—the mechanisms that lead climate strength to moderate the relationship between climate and outcomes in larger organizations may be entirely different. For example, low climate strength in small groups almost certainly indicates disagreements (about climate) between individuals who work together closely. On the other hand, low climate strength in large organizations may only mean that different sections of the organizations have differing experiences of climate, and there is no real disagreement within departments.

Practical implications

There are some potential practical implications of the findings of this study for managers. If the curvilinear results are correct, then it appears that there may be a danger not simply in having weak climates generally but also in having very strong climates for Means Emphasis (Integration) in large organizations such as hospitals. A very strong climate is likely to occur when working practices are controlled in a strict way from the very top of an organization or a "strong culture" whose underlying values are not questionable, with potentially negative impacts for long term performance (Argyris, 1976; Denison, 1984). It does not appear to matter what these working practices are—neither the linear nor the curvilinear effects of

climate strength interacted with climate levels—but rather the fact that throughout the entire organization, most people were in agreement about their climate. More positive results were found when there were slightly less strong climates—which can occur when individual departments, wards, and teams have a level of autonomy to determine their own practices. This appears to be particularly appropriate in organizations such as hospitals where departments can be quite different in the nature of the task performed. However, there may also be a danger of too little control, as evidenced by the poorer outcomes associated with very weak climates for the curvilinear effects. If teams and departments are left completely alone to “do their own thing”, without common understandings of how or why, the result may be more negative for the organization.

Of course, as the results in this study are of a relatively exploratory nature, and the curvilinear effect was only found for one of three variables, these suggestions are somewhat tentative. We would encourage further research in order to establish whether these patterns hold in other studies.

Limitations

We acknowledge that there are a number of limitations in this study. First and foremost, there is no clear argument for causality. As the performance ratings were collected very soon after the questionnaires were returned, it is plausible that knowledge of the hospitals’ performance affects the climate strength within a hospital. For example, if a hospital is known to some staff to be performing poorly, but this is not a widespread knowledge, this may lead to those people who know about the poorer performance rating the climate lower than other staff. Second, the lack of a clear theoretical framework for climate strength in larger organizations means that this work is more exploratory in nature, and could lead to the capitalization of chance in results. Third, the performance measures, although highly useful in conjunction with this survey because of the consistent time lag between the survey and ratings, are not necessarily the optimal outcome measures for hospitals—although they are treated as very important by the organizations themselves due to the high profile of the inspections and the inspecting body, and the public nature of the results.

A further limitation is that the setting of hospitals may not be very generalizable. The tasks involved in healthcare are very specific, and NHS hospitals are very public by their nature: The level of interaction between employees and the public (e.g., patients, visitors), for example, is very high. Some of the mechanisms that cause the results described in this article may not work in the same way in other service, or nonservice, organizations.

Future directions

Given the exploratory nature of the analyses presented in this article, it is highly desirable that replication studies should be carried out. In particular, the curvilinear nature of the relationships is worthy of further investigation. Although the reasons suggested for these relationships make sense in terms of a complex, departmentalized organization such as a hospital, it may be that a different type of relationship is found in a different type of organization, or indeed for a different, perhaps more salient, outcome variable. The differences between the results for different climate variables may be due to different strengths of effect being present in the underlying population, or it may be that there are genuinely different relationships operating for different types of climate variable. We recommend that organizational researchers should consider the role that climate strength at the organizational level plays, both theoretically and empirically.

REFERENCES

- Anderson, N., & West, M. A. (1998). Measuring climate for work group innovation: Development and validation of the team climate inventory. *Journal of Organizational Behavior*, 19, 235–258.
- Argyris, C. (1976). Problems and new directions for industrial psychology. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 151–184). Chicago: Rand McNally.
- Ashkanasy, N. M., Wilderom, C. P. M., & Peterson, M. F. (2000). *Handbook of organizational culture and climate*. London: Sage.
- Barsade, S. G., Ward, A. J., Turner, J. D. F., & Sonnenfeld, J. A. (2000). To your heart's content: A model of effective diversity in top management teams. *Administrative Science Quarterly*, 45, 802–836.
- Berscheid, E., & Walster, H. (1978). *Interpersonal attraction*. Reading, MA: Addison-Wesley.
- Bliese, P. D. (2000). Within-group agreement, non-independence and reliability. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research and methods in organizations: Foundations, extensions and new directions* (pp. 349–381). San Francisco: Jossey-Bass.
- Bliese, P. D., & Halverson, R. R. (1998). Group consensus and psychological well-being: A large field study. *Journal of Applied Social Psychology*, 28, 563–580.
- Brodbeck, F. (1996). Work group performance and effectiveness: Conceptual and measurement issues. In M. A. West (Ed.), *The handbook of work group psychology* (pp. 285–316). Chichester, UK: Wiley.
- Brown, K. G., & Kozlowski, S. W. J. (1999). *Dispersion Theory: Moving beyond a dichotomous conceptualization of emergent organizational phenomena*. Paper presented at the 14th annual meeting of the Society of Industrial and Organizational Psychology, Atlanta, GA, USA.
- Burke, M. J., & Dunlap, W. P. (2002). Estimating interrater agreement with the average deviation index: A user's guide. *Organizational Research Methods*, 5, 159–172.
- Burke, M. J., Finkelstein, L. M., & Dusig, M. S. (1999). On average deviation indices for estimating interrater agreement. *Organizational Research Methods*, 2, 49–68.

- Byrne, D. (1971). *The attraction paradigm*. New York: Academic Press.
- Campbell, J. P., Dunnette, M. D., Lawler, E. E., & Weick, K. E. (1970). *Managerial behavior, performance and effectiveness*. New York: McGraw Hill.
- Chan, D. (1998). Functional relationships among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology*, 83, 234–246.
- Chatman, J. A., Polzer, J. T., Barsade, S. G., & Neale, M. A. (1999). Being different yet feeling similar: The influence of demographic composition on work processes and outcomes. *Administrative Science Quarterly*, 43, 749–780.
- Dawson, J. F. (2003). Do we have enough? The accuracy of incomplete data from small groups. *Academy of Management Meeting Best Paper Proceedings* [CD-ROM]. Briarcliff Manor, NY: Academy of Management.
- Denison, E. F. (1984). Productivity analysis through growth accounting. In A. P. Brief (Ed.), *Productivity research in the behavioral and social sciences* (pp. 7–55). New York: Praeger.
- Glick, W. H. (1985). Conceptualizing and measuring organizational and psychological climate: Pitfalls in multilevel research. *Academy of Management Review*, 10, 601–616.
- González-Romá, V., Peiro, J. M., & Tordera, N. (2002). An examination of the antecedents and moderator influences of climate strength. *Journal of Applied Psychology*, 87, 465–473.
- González-Romá, V., & West, M. A. (2005). *Agreeing to disagree: Team climate, climate strength and innovation in work teams*. Unpublished manuscript, University of Valencia, Spain.
- Green, S. G., Anderson, S. A., & Shivers, S. L. (1996). Demographic and organizational influences on leader-member exchange and related work attitudes. *Organizational Behavior and Human Decision Processes*, 66, 203–214.
- Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface- and deep-level diversity on work group cohesion. *Academy of Management Journal*, 41, 96–107.
- Harrison, D. A., Price, K. H., Gavin, J. H., & Florey, A. T. (2002). Time, teams, and task performance: Chancing effects of surface- and deep-level diversity on group functioning. *Academy of Management Journal*, 45, 1029–1045.
- Healthcare Commission. (2004). *Manual of clinical governance review/inspection practices*. Retrieved 16 February, 2005, from <http://www.healthcarecommission.org.uk/>
- Jackson, S. E., Brett, J. F., Sessa, V. I., Cooper, D. M., Julin, J. A., & Peyronnin, K. (1991). Some differences make a difference: Individual dissimilarity and group heterogeneity as correlates of recruitment, promotions, and turnover. *Journal of Applied Psychology*, 76, 675–689.
- James, L. R. (1982). Aggregation bias in estimates of perceptual agreement. *Journal of Applied Psychology*, 67, 219–229.
- James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology*, 69, 85–98.
- James, L. R., Demaree, R. G., & Wolf, G. (1993). r_{wg} : An assessment of within-group interrater agreement. *Journal of Applied Psychology*, 78, 306–309.
- Jehn, K. A., Northcraft, G. B., & Neale, M. A. (1999). Why differences make a difference: A field study of diversity, conflict, and performance in workgroups. *Administrative Science Quarterly*, 44, 741–763.
- Kopelman, R. E., Brief, A. P., & Guzzo, R. A. (1990). The role of climate and culture in productivity. In B. Schneider (Ed.), *Organisational climate and culture* (pp. 282–318). San Francisco: Jossey-Bass.
- Koys, D. J., & DeCotlis, T. A. (1991). Inductive measures of psychological climate. *Human Relations*, 44, 265–285.

- Lindell, M. K., & Brandt, C. J. (2000). Climate quality and climate consensus as mediators of the relationship between organizational antecedents and outcomes. *Journal of Applied Psychology, 85*, 331–348.
- Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychological Review, 80*, 252–283.
- Neal, A., West, M. A., & Patterson, M. G. (2004). *Do organizational climate and strategic orientation moderate the relationship between human resource management practices and productivity?* (Discussion Paper No. 624). London: Centre for Economic Performance.
- Patterson, M. G., Warr, P. B., & West, M. A. (2004). Organizational climate and company performance: The role of employee affect and employee level. *Journal of Occupational and Organizational Performance, 77*, 193–216.
- Patterson, M. G., West, M. A., Shackleton, V. J., Dawson, J. F., Lawthom, R., Maitlis, S., & Robinson, D. L. (2005). Validating the organizational climate measure: Links to managerial practices, productivity and innovation. *Journal of Organizational Behavior, 26*, 379–408.
- Pelled, L. H., Ledford, G. E., & Mohrman, S. A. (1999). Demographic dissimilarity and workplace inclusion. *Journal of Management Studies, 36*, 1013–1031.
- Quinn, R. E., & Rohrbaugh, J. (1983). A spatial model of effectiveness criteria: Toward a competing values approach to organizational analysis. *Management Science, 29*, 363–377.
- Richard, O. C., & Shelor, R. M. (2002). Linking top management team age heterogeneity to firm performance: Juxtaposing to mid-range theories. *International Journal of Human Resource Management, 13*, 958–974.
- Rousseau, D. M. (1988). The construction of climate in organizational research. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 3, pp. 139–158). New York: Wiley.
- Schneider, B. (1990). The climate for service: An application of the climate construct. In B. Schneider (Ed.), *Organizational climate and culture* (pp. 383–412). San Francisco: Jossey-Bass.
- Schneider, B., Bowen, D. E., Erhart, M. G., & Holcombe, K. M. (2000). The climate for service: Evolution of a construct. In N. M. Ashkanasy, C. P. M. Wilderom, & M. F. Peterson (Eds.), *Handbook of organizational culture and climate* (pp. 21–36). London: Sage.
- Schneider, B., Gunnarson, S. K., & Niles-Jolly, K. (1994). Creating the climate and culture of success. *Organizational Dynamics, 23*, 17–29.
- Schneider, B., Hanges, P. J., Smith, D. B., & Salvaggio, A. N. (2003). Which comes first: Employee attitudes or organizational financial and market performance? *Journal of Applied Psychology, 88*, 836–851.
- Schneider, B., Salvaggio, A. N., & Subirats, M. (2002). Climate strength: A new direction for climate research. *Journal of Applied Psychology, 87*, 220–229.
- Schneider, B., White, S. S., & Paul, M. C. (1998). Linking service climate and customer perceptions of service quality: Tests of a causal model. *Journal of Applied Psychology, 83*, 150–163.
- Timmerman, T. A. (2005). Missing persons in the study of groups. *Journal of Organizational Behavior, 26*, 21–36.
- Tsui, A. S., & O'Reilly, C. A. (1989). Beyond simple demographic effects: The importance of relational demography in superior-subordinate dyads. *Academy of Management Journal, 32*, 402–423.
- van Knippenberg, D., & Schippers, M. C. (2007). Work group diversity. *Annual Review of Psychology, 58*, 515–541.
- Webber, S. S., & Donahue, L. M. (2001). Impact of highly and less job-related diversity on work group cohesion and performance: A meta-analysis. *Journal of Management, 27*, 141–162.

- West, M. A. (1990). The social psychology of innovation in groups. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 81–100). Chichester, UK: Wiley.
- West, M. A., & Anderson, N. R. (1996). Innovation in top management teams. *Journal of Applied Psychology*, 81, 680–693.
- Williams, K. Y., & O'Reilly, C. A. (1998). Demography and diversity in organizations: A review of 40 years of research. In B. Staw & L. Cummings (Eds.), *Research in organizational behavior* (Vol. 20, pp. 77–140). Greenwich, CT: JAI Press.

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